



# Performance of Blackgram Varieties under Rainfed Conditions of Chamarajanagar District in Karnataka

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## ABSTRACT

A field experiment was conducted at Krishi Vigyan Kendra, Chamarajanagar, Karnataka to study the performance of blackgram varieties under rainfed condition of Chamarajanagar district. The varieties included in the test were LBG 625 (Check), LBG 791 and KU14-8. Among three varieties LBG 791 (1.24 %) recorded significantly lower yellow mosaic incidence which was at par with KU14-8 (1.47 %) compared to LBG 625 (31.3 %). However, grain yield, haulm yield and harvest Index were higher with LBG 791 as compared to LBG 625. Similar trend was observed for growth and yield parameters. The highest gross returns and B:C Ratio of Rs.36,302/ha and 1.41, respectively were realized with LBG 791 as compared to LBG 625.

**Key Words:** Blackgram, Economic, Rainfed, Yellow mosaic incidence.

## INTRODUCTION

Blackgram (*Vigna mungo* L.) also known as urd bean in India is one of the most important cultivated pulse crops of the 'Vigna' group (Pandey *et al*, 2009). It is a staple pulse crop in India occupying an area of 44.93 lakh ha with 29.26 lakh tonne production and 651 kg/ha productivity. In Karnataka, the area, production and productivity were 3.02 m ha, 1.86 m t and 614 kg/ha, respectively (Anon, 2017). In Karnataka, Chamarajanagar district is known for its varied agro-climatic conditions with diversified cropping situation. Among different pulses grown in district, black gram occupies major areanext to horsegram and greengram. The district productivity of black gram is 203 kg/ha (Anon, 2018a). The major reasons for the lower productivity of black gram are non-availability of season based quality seeds resulting in increased pest and disease incidence particularly yellow mosaic virus, use of local and photo insensitive varieties followed by erratic rainfall, cultivation of crops under poor and marginal lands, broadcasting of seeds, no seed treatment with bio-fertilizers (Rhizobium and PSB), not practicing application of micronutrients, Poor management of pests and diseases (Anon, 2018b).

In this context, the present study was undertaken to evaluate three different varieties suitable for rainfed conditions of Chamarajanagar district.

## MATERIALS AND METHODS

As a part of on farm testing a field experiment was conducted during 2018-2019 to 2019-2020 at Krishi Vigyana Kendra, Chamarajanagar located in the Southern Dry Zone of Karnataka. The soil of the experimental site was red loamy in texture and pH was 7.82. The soil was less in available nitrogen (136kg/ha) and potassium (164kg/ha) and medium in phosphorus (20.9kg/ha). The organic carbon content was low in range (0.46%). An experiment was replicated seven times in randomized complete block design (RCBD). The experiment included three varieties out of which two varieties were from other states and one susceptible check in the present study. The different varieties were LBG 625 also known as Rashmi released from UAS, GKVK, Bengaluru has become susceptible to yellow mosaic incidence grown during pre-kharif and producing higher biomass with less yield and shiny seeds so fetching less price; LBG 791: released by Agricultural Research Station, Lam, Andhra

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**Table 1. Growth and yield parameters of different blackgram varieties under rainfed condition of Chamarajanagar District**

Variety	Plant Height (cm)	No. of Branches/ plant	Nodules Count		Per cent Yellow Mosaic disease	No. of Pods/ plant	Pod length (cm)	No. of Seeds / Pod	Seed Index (g)	Days to Maturity
			Effective Nodules	Ineffective Nodules						
LBG 625	49.3	4.31	12.71	2.71	5.63(31.3)	35.9	4.9	6.40	5.06	90.3
LBG 791	36.6	4.92	12.79	2.71	1.20 (1.24)	41.6	5.5	7.65	5.47	79.7
KU 14-8	28.6	1.68	12.36	2.79	1.27 (1.41)	36.8	5.4	7.61	5.19	74.0
Sem $\pm$	0.79	0.13	0.41	0.16	0.12	0.57	0.05	0.12	0.02	0.52
CD	2.27	0.39	NS	NS	0.34	1.65	0.16	0.35	0.05	1.50

Note:Pooled data of 2 years(2018 & 2019), NS:Non-significant, Original values are in parentheses

**Table-2: Yield and economics of differentblackgram varietiesunder rainfed condition of Chamarajanagar District**

Variety	Grain Yield (kg/ha)	Haulm Yield (kg /ha)	Harvest index	COC	Gross Returns	Net Returns	B:C ratio
LBG 625	363	1854	0.16	22208	16346	-5862	0.74
LBG 791	727	2442	0.23	22208	36302	14094	1.63
KU 14-8	627	2219	0.22	22208	31280	9072	1.41
Sem $\pm$	15.91	62.87	0.01	-	-	-	-
CD	45.95	181.6	0.02	NA	NA	NA	NA

Note:Pooled data of 2 years (2018 & 2019),NA: Not Analyzed

## Performance of Blackgram Varieties

Pradesh is Resistance to YMV, photo insensitive, non-shiny seeds and third one was KU 14-8 released from TNAU determinate type, upright pods, Non-shiny seeds was sown in May month with a spacing of 30 cm × 10 cm. The remaining cultivation practises were followed as per the package of practise of UAS, GKVK, Bengaluru.

Disease incidence (%) was calculated by counting the number of plants infected and total number of plants in an m<sup>2</sup>areaseparately (Archana *et al*, 2018).The data on per cent yellow mosaic incidence was subjected to  $\sqrt{x+0.5}$  transformation as suggested by Gomez and Gomez (1984) before statistical analysis. Randomly five plants from each treatment were collected (at harvesting stage) for assessing plant growth and yield parameters. Growth characters , yield parameters and yield per hectare were recorded and average data obtained from sample plants was analysed statistically by analysis of variance method for randomized block design (Gomez and Gomez, 1984). Critical differences were worked out at 5% probability level. The response of blackgram varieties under rainfed condition of Chamarajanagar district was similar in both the years of study. Therefore, only pooled data of two years was discussed.

## RESULTS AND DISCUSSION

The per cent incidence of yellow mosaic virus disease was significantly higher with LBG 625 as compared to LBG 791 and KU 14-8 presented (Table 1). These results may be attributed by biochemical compounds on the leaves, which repelled insects from host plant (Taggar *et al*, 2014). Antioxidative compounds have the ability to form insoluble complexes with proteins, act as enzyme inhibitors or are oxidized to toxic quinines, thus rapid accumulation of phenols in resistant genotypes (Metraux and Raskin, 1993). On the other hand, physical factors such as leaf area, pubescence and lamina thickness must also be taken into account regarding host selection and might play a role in imparting resistance in black gram plants to B.

tabaci (Pavishna *et al*, 2019 and Taggar and Gill, 2012).

Among the varieties tested the check LBG 625 has significantly recorded higher plant height as compared to LBG 791 followed by KU 14-8 whereas the number of branches was more in LBG 791 as compared to LBG 625 followed by KU 14-8. However, the results of effective and in-effective nodules were not significant (Table 1).It was evident from the results that the treatments which recorded least per cent yellow mosaic virus disease incidence have shown a significant positive impact on all the growth parameters evaluated(Archana *et al*, 2018).

The yield parameters viz., number of pods per plant, pod length, number of seeds per pod, seed index and days taken for maturity revealed that the variety LBG 791 recorded significantly higher yield parameters followed by KU14-8 whereas the days taken for maturity was less in case of KU14-8 (74d) followed by LBG791(79.4 d) and LBG-625 (90.3 d). The better yield parameters were mainly due to good growth parameters (Archana *et al*, 2018).The maximum grain yield was obtained with LBG791 (727 kg/ha) followed by KU14-8 (627 kg/ha) and (363 kg/ha). The similar trend was also observed with harvest index, gross returns, net returns and B:C Ratio (Table 2).

## CONCLUSION

The varietal experiments conducted during two consecutive years (2018 and 2019) showed that black gram genotype LBG 791 has recorded significantly good yield with less incidence of per cent yellow mosaic virus disease under rainfed conditions of Chamarajanagar district.

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